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U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEY'S DOCKET NUMBER

VMF-495-A

U.S. APPLICATION NO. (if known, see 37 CFR 1.5

10/089138

INTERNATIONAL APPLICATION NO.

PCT/FR00/02768

INTERNATIONAL FILING DATE

02 October 2000

PRIORITY DATE CLAIMED

30 September 1999

TITLE OF INVENTION WIPER MECHANISM WITH ALTERNATING LINEAR WIPER
COMPRISING IMPROVED MEANS FOR TENSIONING THE CABLE

APPLICANT(S) FOR DO/EO/US

Eric Hospital and Gilles Berge

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.
4. ☒ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☒ is attached hereto (required only if not communicated by the International Bureau).
 - b. ☐ has been communicated by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
 - a. ☒ is attached hereto.
 - b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
 - a. ☐ are attached hereto (required only if not communicated by the International Bureau).
 - b. ☐ have been communicated by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☐ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11 to 20 below concern document(s) or information included:

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A **FIRST** preliminary amendment.
14. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
15. ☒ A substitute specification.
16. ☐ A change of power of attorney and/or address letter.
17. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
18. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
19. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
20. ☒ Other items or information: Red-Lined Specification

U.S. APPLICATION NO. (known or not known) Unknown 10089138		INTERNATIONAL APPLICATION NO. PCT/FR00/02768		ATTORNEY'S DOCKET NUMBER VMF-495-A	
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21. <input checked="" type="checkbox"/> The following fees are submitted: BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)): Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO. \$1040.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO \$890.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$740.00 International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$710.00 International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) \$100.00 ENTER APPROPRIATE BASIC FEE AMOUNT =	CALCULATIONS PTO USE ONLY																
	\$ 890																
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).	\$ 0																
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:20%;">CLAIMS</th> <th style="width:20%;">NUMBER FILED</th> <th style="width:20%;">NUMBER EXTRA</th> <th style="width:20%;">RATE</th> <th style="width:20%;">\$</th> </tr> <tr> <td>Total claims</td> <td>14 - 20 =</td> <td>0</td> <td>x \$18.00</td> <td>\$</td> </tr> <tr> <td>Independent claims</td> <td>1 - 3 =</td> <td>0</td> <td>x \$84.00</td> <td>\$</td> </tr> </table>	CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	\$	Total claims	14 - 20 =	0	x \$18.00	\$	Independent claims	1 - 3 =	0	x \$84.00	\$		
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	\$													
Total claims	14 - 20 =	0	x \$18.00	\$													
Independent claims	1 - 3 =	0	x \$84.00	\$													
MULTIPLE DEPENDENT CLAIM(S) (if applicable)	+ \$280.00	\$															
TOTAL OF ABOVE CALCULATIONS =	\$ 890																
<input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.	\$ 0																
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Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).	\$ 0																
TOTAL NATIONAL FEE =	\$ 890																
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +	\$ 40																
TOTAL FEES ENCLOSED =	\$ 930																
	Amount to be refunded:	\$															
	charged:	\$															

a. ☒ A check in the amount of \$ 930.00 to cover the above fees is enclosed.

b. ☐ Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees.
 A duplicate copy of this sheet is enclosed.


c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any
 overpayment to Deposit Account No. 25-0115. A duplicate copy of this sheet is enclosed.

d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. **Credit card
 information should not be included on this form.** Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR
 1.137 (a) or (b)) must be filed and granted to restore the application to pending status.

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William M. Hanlon, Jr.
 NAME
28422
 REGISTRATION NUMBER

Our Reference: MF0434 (VMF-495-A)

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Eric Hospital and Gilles Berge
Serial Number: Unknown
Filing Date: Concurrent
Examiner/Art Group Unit: Unknown/Unknown
Title: WIPER MECHANISM WITH
ALTERNATING LINEAR WIPING AND
IMPROVED MEANS FOR TENSIONING
THE CABLE

PRELIMINARY AMENDMENT

Assistant Commissioner of Patents
Washington, D.C. 20231

Sir:

If any charges or fees must be paid in connection with the following communication, they may be paid out of our Deposit Account No. 25-0115.

Prior to initial examination, please amend the above-identified patent application as indicated below.

In the specification:

After the claims, start a new page and insert:

ABSTRACT

A wiper mechanism includes a guide carriage sliding on a rail and bearing a wiper blade and a driver carriage including a cable in which a strand is linked to the carriage and passes along a mobile return member. A groove guiding the cable is elastically stressed to form an automatic cable tensioning member. A body of a return member the groove guiding the cable is formed in fixed relative to the linear movement of the cable which slides in the groove. The cable tensioning device includes a elastic member which urges the body along a direction globally perpendicular to the section of the cable sliding in the guiding groove.

In the claims:

Cancel claims 1-14 and substitute new claims 15-28.

1 15. A wiper mechanism with alternating linear wiping including a
2 guide and drive carriage that is slidingly mounted on at least one fixed rigid guiding
3 rail and which bears at least one wiper blade, and carriage driving means including
4 an electric motor which puts the cable, a strand of which is linked to the carriage,
5 into linear movement, and which passes along at least one return member having a
6 guide groove for the cable, which is movably mounted relative to vehicle structure
7 and which is elastically urged to make up a cable tensioning device, characterized by
8 the body of the return member in which the guiding groove of the cable is formed
9 being fixed relative to the linear movement of the cable that slides in the groove, and
10 in which the cable tensioning device includes elastic means for urging the body
11 along a direction substantially perpendicular to the cable section that slides in the
12 guiding groove.

1 16. The wiper mechanism according to claim 15, characterized by
2 the cable tensioning device comprising a fixed support relative to which the body of
3 the return member is movably mounted with the interposition of the elastic means
4 that urge the body of the return member towards an involvement position with the
5 cable to hold the cable.

1 17. The wiper mechanism according to claim 16, characterized by
2 the body of the return member being slidingly mounted longitudinally relative to the
3 fixed support, and by the elastic means urging the body of the return member towards
4 a front involvement position with the cable.

1 18. The wiper mechanism according to claim 17, characterized by
2 the guiding groove of the cable being in the shape of a circular arc, and in the
3 direction of the sliding of the body of the return member relative to the fixed support
4 being radial relative to the guiding groove.

1 19. The wiper mechanism according to claim 16, characterized
2 by the elastic means comprising at least one compression spring linked according to
3 the direction of sliding of the body of the return member.

1 20. The wiper mechanism according to claim 16, characterized by
2 the body of the return member being substantially in the form of a section of a fixed
3 wheel pulley, and by the guiding means of the wheel section comprising means for
4 guiding the return member by sliding a horizontal plane parallel to a plane in which
5 the guiding groove of the cable extends, and means for guiding the return member in
6 this plane along the direction D of longitudinal sliding.

1 21. The wiper mechanism according to claim 20, characterized by
2 the fixed support comprising two guiding, horizontal, parallel flanks of the body of
3 the return member that cooperate with lateral faces opposite from the wheel in order
4 to guide the body of the return member by sliding in a horizontal plane parallel to the
5 plane in which the guiding groove of the cable extends.

1 22. The wiper mechanism according to claim 21, characterized by
2 the rear part of the body of the return member, opposite from a front part in which the
3 guiding groove of the cable is formed, comprising a longitudinal cavity in which a
4 guiding notch on a fixed support is slidably received and in which a compression
5 spring is disposed.

1 23. The wiper mechanism according to claim 21, characterized by
2 the rear part of the body of the return member, opposite from a front part in which the
3 guiding groove of the cable is formed, comprising a longitudinal cavity in which a
4 guiding notch on a fixed support is slidably received and in which a compression
5 spring is disposed, and by, in a transversal section, the complementary profiles of the
6 notch and of the cavity are not revolving around the longitudinal sliding direction in a
7 manner to slidably guide the body of the return member in a horizontal plane parallel

8 to the plane in which the guiding groove of the cable extends.

1 24. The wiper mechanism according to claim 16, characterized by
2 the body of the return member being movably mounted relative to the fixed support.

1 25. The wiper mechanism according to claim 24, characterized by
2 the body of the return member comprising at least one fixed pulley wheel which is
3 carried by a plate pivotally mounted relative to the fixed support around a pivoting
4 axis parallel to and off center relative to the axis of the wheel of the fixed pulley
5 wheel and by the elastic means urging the plate to pivot around the pivoting axis.

1 26. The wiper mechanism according to claim 17, characterized by
2 the cable tensioning device comprising anti-return means, of the notch type
3 interposed between the fixed support and the body of the return member to block
4 displacement of the body in the direction opposite to that corresponding to the urging
5 of the body with the cable.

1 27. The wiper mechanism according to claim 17, characterized by
2 the body of the return member being a molded piece.

1 28. The wiper mechanism according to claim 17, characterized by
2 the fixed support being one molded piece.

100

REMARKS


After entry of this amendment, claims 1-14 have been canceled. New claims 15-28 have been added.

A handwritten, corrected copy of the specification is enclosed showing the changes which have been made to the specification as required by Section 608.01(Q) and 714.20(1) of the Manual of Patent Examining Procedure. The Substitute Specification filed herewith has been amended to utilize idiomatic English, correct minor typographical and grammatical errors and to conform the application to current United States patent practice. The Substitute Specification includes no new subject matter; but does include the same changes handwritten in red in the attached, corrected, original specification. Entry of the Substitute Specification is respectfully requested.

It is submitted that this Amendment has antecedent basis in the application as originally filed, including the specification, claims and drawings, and that this Amendment does not add any new subject matter to the application. Consideration of the application as amended is requested.

Respectfully submitted,

YOUNG, BASILE, HANLON, MacFARLANE, WOOD
& HELMHOLDT, P.C.


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Dated: March 22, 2002
WMH/jao

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the specification:

The abstract is new.

In the claims:

Claims 1-14 are cancelled.

New claims 15-28 are included herein.

5/pts

1

Wiper mechanism with alternating linear wiping comprising improved means for tensioning the cable.

This invention concerns a wiper mechanism with alternating linear wiping for a motor vehicle.

5 The invention aims to allow the wiping of a windshield or a rear window of a motor vehicle.

According the broadest conception in the domain of automobile construction, each wiper performs an alternating wiping of the window to be wiped with a rotational alternating movement around an axis fixed relative to the window
10 frame structure.

Such wiping, whether it is performed by means of only one wiper or two wipers of parallel or antagonistic wiping, leaves relatively important parts of the window unwiped.

In order to remedy these inconveniences, complex mechanisms aiming
15 to displace the articulation axis of each wiper in order to increase the surface effectively wiped have already been proposed.

According to another conception, which is for example described and represented in documents DE-A-4.234.202 or FR-A-2.658.460, alternating linear wiping of the window to be wiped by means of a wiper mechanism of the type
20 comprising a guide carriage sliding relative to the body of the vehicle on at least one guiding rail, or the equivalent, extends along the window to be wiped, generally along the lower edge of the window, has already been proposed.

The carriage bears a near end of an arm or a wiper blade, the far end of which bears a wiping blade of the window.

25 The wiper mechanism also comprises means of driving the carriage including, for example, a flexible driving part in a closed loop held between two pulleys and which is linked to the carriage, and a driving motor that transmits alternating scrolling movement to the flexible driving member.

Thanks to such a conception, the wiper blade born via the wiper arm, or directly via the carriage, can perform a quasi complete wiping of the window to be wiped, the contour of which is generally notably rectangular.

5 The flexible driving member in a closed loop is notably a driving cable.

 The tension of the cable is an element determined for good functioning of the wiper mechanism.

 In order to assure an optimal route of the cable as well as automatic and controlled tension of it, different conceptions of return devices and cable
10 tensioning devices have already been proposed.

 This is, for example, the case in document DE-C-1.051.139 which describes and represents a cable tensioning device comprising an articulate lever urged via a spring, the free end of which bears a return movement turning pulley in which the cable passes.

15 Such a conception is complex because it calls on numerous components to be assembled between them and notably a idle pulley the wheel of which is turning attached to the free end of the articulated lever.

 The invention aims to propose a simplified conception of the return means and the cable tension.

20 With this goal, the invention proposes a wiper mechanism with alternating linear wiping comprising a guide carriage sliding on at least one rigid fixed driving rail and which bears at least one wiper blade, and comprising driving means for the carriage comprising an electric motor which puts into linear movement a cable whereof a strand of which is linked to the carriage and passes along at least
25 one mobile return member, comprising a groove guiding the cable, which is elastically stressed to form an automatic cable tensioning member, characterized by the body of the return member wherein the groove guiding the cable is formed is fixed relative to the linear movement of the cable which slides in the groove, and the cable tensioning device comprises elastic means which urge the body along a
30 direction globally perpendicular to the section of cable sliding in the guiding groove.

 According to other characteristics of the invention:

- the rear part of the body of the return member, opposite from its front part in which the guiding groove of the cable is formed, comprises a longitudinal cavity in which a guiding contact belonging to the fixed support and in which is lodged a compression spring, is received via sliding, and, in a transversal section, the complementary profiles of the contact and the cavity are not revolving around the longitudinal sliding direction in a manner to guide the body of the return

member via sliding in a horizontal plane parallel to the plane in which the cable guiding groove extends;

- the body of the return member is mounted turning relative to the fixed support;

5 - the body of the return member comprises at least one fixed pulley wheel which is born by a plate which is mounted pivoting relative to the fixed support around an axis pivoting parallel to the axis of the wheel of the fixed pulley and off center relative to it, and elastic means permanently urge the plate to pivot around its axis;

10 - the cable tensioning device comprises anti-return means, notably means of the notch type, which are interposed between the fixed support and the body of the return member in order to block the displacement of the member in the direction opposite to that corresponding to involvement with the cable;

- the body of the return member is a molded piece, in a plastic

15 material;

- the fixed support is a molded piece, in a plastic material;

Other characteristics and advantages will appear in the reading of the detailed description that follows, for the comprehension of which one should refer to the attached drawings in which:

20 - figure 1 is a schematic view in perspective illustrating a wiper mechanism with alternating linear wiping comprising different devices, in a known conception, to return the cable;

- figure 2 is a perspective view at a large scale, with partial wrenching, which illustrates a first method of production of a return cable tensioning device

25 created conforming to the specifications of the invention and linked to an end of the guiding rail;

- figure 3 is a spread perspective view of the principal components of a second production method of a return cable tensioning device of the same type as that illustrated in figure 2, represented without the cable;

30 - figure 4 is a large scale view, a partial longitudinal section along line 4-4 on figure 5, of the device represented in figure 3;

- figure 5 is a section view along line 5-5 of figure 4;
- figure 6 is a schematic perspective view of a third production method of a return cable tensioning device created conforming to the specifications of the invention and attached onto the guiding rail;

5 - figure 7 is a perspective view along another angle which illustrates the components of a production variant of the device in figure 6, represented without the cable;

 - figure 8 is a perspective view of the same type as that in figure 6 which illustrates a fourth production method of a return cable tensioning device conforming to the specifications of the invention;

10

 - figures 9 and 10 are two schematic views in perspective which illustrate a fifth production method of a return cable tensioning device conforming to the specifications of the invention in which the body of the return member is mounted pivoting relative to the fixed support.

15 In the description that follows, identical, similar or analog elements will be designated by the same reference numbers.

 Figure 1 represents a wiper mechanism 10 with alternating linear wiping of the type comprising a fixed guiding rail 12 on which is mounted alternatively sliding and in both directions a carriage 14 which bears a wiper 16 comprising at least one wiper blade 18 for alternating linear wiping of a window (not represented) of a motor vehicle, for example a windshield or rear window.

20

 According to a generally known conception, for the alternating sliding driving of the carriage 14 along the guiding rail 12, the mechanism 10 comprises driving means comprising a reduction motor 20 that acts on the strand of a flexible cable 2 in a closed loop, another strand of which is attached to the carriage 14.

25

 In order to form and orient the closed loop of the cable 21, it passes over different return devices which, according to a known conception are, for example, idles return pulleys 22 attached to the opposite ends of the rail 12, other intermediary return idles pulleys 24 born on a solid plate 26 of the rail 12, or between a central return idle pulley 28 born by the plate 26 and onto which the cable is unrolled during complete rotation.

30

Figure 2 represents a first production method according to the invention of a return device also forming an automatic cable tensioning device.

In this first production method, the device 30 of the invention is destined to replace more specifically a pulley 22, that is to say that it is mounted to an
5 end of the rail 12.

The device 30 is made up of, essentially, a body 32 in which a cable guiding groove 34 of the cable 21 and a fixed support 36 mounted to the free end of the rail 12 are formed.

The body 32 and the fixed support 36 are preferably two pieces
10 created via molding in a plastic material.

Conforming to the specifications of the invention, via opposition to a turning return pulley according to the state of the art, the body 32 of the return member is globally fixed relative to the cable, that is to say that it, in its alternating movement, slides in the guiding groove 34.

According to the first production method illustrated in figure 2, the
15 body 32 is globally in the shape of a half wheel of a fixed return pulley, that is to say that the groove 34 extends in a half circle in the front, convex cylindrical face 38.

The body 32 is also defined by its vertical rear transversal flat face 40 and by two lateral, parallel, horizontal opposite face 42.

The body 32 comprises a cavity 44, with a transversal section in a square or rectangular profile, which longitudinally unblocks toward the rear in the transversal face 40.
20

According to the invention, the body 32 comprising the guiding groove 34 of the cable 21 is mounted by longitudinal sliding, according to direction
25 ?D? relative to the fixed support 36.

With that in mind, the molded body 46 of the fixed support 36, longitudinally fits together in the open end of the rail 12, comprising a guiding contact 48 that extends longitudinally towards the projection from a transversal face of the front end 50 of the fixed support 46 and that is received in the cavity 44.

With that in mind, the external profile of the contact 48 is
30 complementary to the internal profile, with a rectangular transversal section, of the

cavity 44 in such a way as to guide the body 32 of the return member via sliding according to the direction \vec{D} relative to the fixed support 36 and in such a way as to block all rotational movement of the body 32 around the axis D of displacement.

In this way, the body 32 of the return member comprising the groove
5 34 can displace itself according to the longitudinal direction D and in a horizontal plane corresponding to the plane in which the groove 34 extends.

In order to make up a cable 21 tensioning device 30, a helicoidal compression spring 52 is longitudinally interposed between the fixed support 36 and the body 32 of the return member in order to elastically urge it towards the front by
10 involving with the cable 21, that is to say the left towards the right considering figure 2.

As this is illustrated in figure 2, the compression spring 52 is, for example, received in a complementary cylindrical lodging 54 formed in the contact 48 and it pushes against the bottom rear end of the cavity 44.

In order to make up anti-return means, that is to say in order to avoid
15 the body 32 moving back towards the rear, from the right to the left considering figure 2, relative to the fixed support 36, it is possible, for example, to create notches 56 in the lateral faces of the cavity 44 that cooperate via friction with the corresponding lateral faces of the contact 48, which can be smooth as is represented
20 in figure 2, or notched as a variant.

As one can see in figure 2, the body 46 of the fixed support 36 is, at its rear part, in a shape complimentary to that of the end of the rail 12 that receives it and it can also comprise grooves 60 and 62 for guiding the cable 21,

Outside of the placement of the cable 21, of course one initially
25 compresses the spring 52 to its maximum, then one releases the body 32 so that its cable 21 guiding groove 34 comes to be involved with the cable by elastically urging the groove to hold the cable.

It is possible, of course, to attach a return and cable tensioning device 30 to each of the longitudinal ends of the rail 12.

If one desires to equip only one of the ends of the rail 12 with a cable
30 tensioning device, the other end can be equipped with the same device without the

spring 52, to standardize the components, the fixed position of the body 32 relative to the fixed support 36 being defined by abutting the transversal face of the front end 64 of the guiding contact 48 against the rear transversal bottom of the cavity 44.

Of course it is also possible to replace the tensioning device by a
5 simple return device molded in a plastic material in a single piece globally corresponding to the association of the fixed body 36 and of the body 32.

The device 30, according to a second production method represented on figure 3, is globally of the same type as the preceding type, that is to say that it is made up a return and cable tensioning device designed to mounted on one end of the
10 rail 12 and in which the body 32 of the return member is in the shape of a fixed half pulley wheel that is mounted mobile according to a longitudinal direction D relative to the fixed support 36.

This second production method differs from the preceding method first in its conformation of the rear part of the body 46 of the fixed support 36
15 adapted to another shape of guiding rail and, secondly, by the conception of the guiding means via longitudinal sliding of the body 32 of the return member relative to the fixed support 36.

In effect, the cavity 44 is vertically unblocked towards the top and bottom in the lateral faces 42 and the body 46 comprising two opposite and parallel
20 horizontal panels 66 between which the lateral faces 42 of the body 32 are received.

In this way, the faces 42 are received via sliding between the interior faces 68 opposite from the flanks 66 in order to improve the guiding via sliding to maintain the body 32 in a horizontal guiding plane that contains the groove 34, thanks to the augmentation of mutual guiding surfaces between the two components.

25 In addition, this conception allows the attachment of the blocking notches of the ant-return device firstly in the shape of notches 56 formed, for example, in the upper lateral face 42 of the body 32 of the return member and, secondly, in the shape of a complementary notch 57 attached opposite from the interior face 68 of the upper horizontal flank 66 of the body 46.

30 The pawl effect of the anti-return means is obtained thanks to the elasticity of the front longitudinal end part of the upper flank 66 which bears the

notch 57 and which can elastically change shape, thanks to the incline effect due to the conformation of the other notches 56, while the elastic effort exercised by the spring 52 and the release or the relaxation of the cable 21 are such that the clearing of a notch is made necessary.

5 Likewise, the return to zero of the return device forming the cable tensioning device is obtained by raising the upper flank 66 and by longitudinally pushing towards the rear, that is to say from the right towards the left considering figure 3, the body 32 relative to the fixed support 46.

 The third production method represented on figures 6 and 7 is a device
10 30 that is more particularly destined to replace the central pulley 28 according to the state of the art.

 Its general conception and its functioning principal are globally similar to those exposed in reference to the first two production methods.

 In effect, the device 30 comprises a mobile return member forming a
15 cable tensioning device 32 in the shape of a fixed pulley half wheel that is longitudinally mounted mobile relative to a fixed support 36 the body 46 of which is screwed onto the plate 26.

 The general conception of the body 32 of the return member is analog to those described in reference to figures 2 and 3, that is to say that it is longitudinally
20 urged along the direction D by a helicoidal compression spring 52 interposed between the body 32 and the fixed support 36.

 So that the cable 21 can perform a complete turn around the device 30, the body 46 of the fixed support 36 is also shaped as a fixed pulley half wheel with a rear groove 34? in which the cable 21 is unrolled and slides, in the same manner as
25 in the groove 34 of the mobile member 32.

 In the variation represented in figure 7, one has illustrated in a schematic manner the guiding means via sliding, along direction D of the body 32 relative to the plate 26 on which the fixed support 36 is fixed in the shape of a fixed pulley half wheel.

30 The guiding means are, in this way, made up of a longitudinal groove, in direction D, formed in the sheet metal of the plate 26 and in which a guiding finger

is received, not visible on figure 7, produced from molding with the body 32 and which also extends towards the bottom below the lower lateral face 40.

At its front end, the groove 70 comprises an enlarged section 72 allowing the mounting of the guiding finger of the body 32 in the groove 70.

5 The rear transversal face of the spring 52 is here created to push longitudinally directly against the transversal face of the front end 50 of the body 46 of the fixed support 36, while the spring 52 is held here and guided in a relief part 76, produced via molding, which extends above the upper lateral face 42 of the body 32.

10 The fourth production method of the return device forming a cable tensioning device 30 illustrated in figure 8 is designed to replace an intermediary guiding pulley 24 according to the state of the art.

15 In this way, the fixed support 46 is born by the plate 26 and it urges the mobile body 32 of the return member along a longitudinal direction D which is globally transversal and perpendicular to the general direction of the cable section 21 that extends to the right of the device 30.

 The body 32 is here produced in the shape of a fixed pulley half wheel elastically urged by the spring 52 and which comprises a groove 34 in which the corresponding cable section 21 slides.

20 In order to obtain the tension effect of the cable 21, via reaction, two return fixed half-pulleys 80 each of which containing a groove 34? in order to make up a diverted route of the cable 21 between the return member 32 and the two fixed members 80, can, advantageously, be created from a material via molding with the support 46 to which they are attached by a lower plate 82.

25 In the production method schematically illustrated in figures 9 and 10, the return member forming a cable tensioning device is here mounted pivoting around a vertical axis V, that is to say around an axis globally perpendicular to the plane in which the cable 21 extends.

30 The return member 32 is made up of a horizontal plate 84, mounting pivoting relative to a fixed support (not represented but which can be, for example, made directly from the sheet metal of the plate 26) around the vertical axis V and which bears on its upper face 86 two fixed pulley wheels 88, that are advantageously

created via molding from a plastic material and each of which comprises a groove 34 in which the cable 21 slides.

The two fixed wheels 88 are diametrically opposed and the plate 84 is urged to pivot around its axis V in order to make up a diverted path of the cable 21 between the two fixed wheels 88 by sliding in the grooves 34 and 34?.

In this way, at the level of each groove 34, 34? the cable 21 is here also globally urged along direction D which can be assimilated to a direction perpendicular to the direction of the cable section 21 to the right of the groove.

In order to elastically urge permanently the member 32 to pivot around the axis V, in the clockwise direction considering figures 9 and 10 corresponding to the tension of the cable 21, one must interpose a spring 52 between the plate 84 and the fixed support.

As this is schematized in figure 10, the spring 52 is, for example, a spiral spring placed below the plate 84 and one end of which acts on the plate 84 while the other end is attached to the fixed support.

The invention is not limited to the production methods that come from the written descriptions.

The helocoidal compression spring can be replaced by any elastic element assuring the same function and, for example, by a strip spring in the case of the production method illustrated in figure 8, the strip spring can be born by the fixed support or by the return member which can also be molded onto the spring.

CLAIMS

1. Wiper mechanism (10) with alternating linear wiping of the type
5 comprising a guide and drive carriage (14) that is mounted sliding on at least one
fixed rigid guiding rail (12) and which bears at least one wiper blade (18), and of the
type comprising driving means of the carriage including an electric motor (20) which
puts the cable (21), a strand of which is linked to the carriage (14), into linear
movement, and which passes along at least one return member (30), comprising a
10 guide groove (34) of the cable (21), which is mounted mobile relative to the vehicle
structure and which is elastically urged permanently in order to make up a cable
tensioning device, characterized by the body (32) of the return member in which the
guiding groove (34) of the cable (21) is formed is fixed relative to the linear
movement of the cable (21) that slides in the groove, and in which the cable
15 tensioning device comprises elastic means (52) that urge the body (32) along a
direction (D) globally perpendicular to the cable (21) section that slides in the
guiding groove (34).
2. Wiper mechanism according to the preceding claim, characterized
20 by the cable tensioning device (30) comprising a fixed support (36) relative to which
the body (32) of the return member is mounted mobile with interposition of elastic
means (52) that urge the body of the return member towards an involvement position
with the cable (21) in order to hold it.
3. Wiper mechanism according to claim 2, characterized by the body
25 (32) of the return organ being mounted sliding longitudinally (D) relative to the fixed
support (36), and by the elastic means (52) urging the body of the return member
towards a front involvement position with the cable.
4. Wiper mechanism according to the preceding claim, characterized
30 by the guiding groove (34) of the cable (21) being in the shape of a circular arc, and

by the direction (D) of the sliding of the body (32) of the return member relative to the fixed support (36) being notably radial relative to the guiding groove.

5 5. Wiper mechanism according to one of claims 2 to 4, characterized by the elastic means comprising at least one compression spring (52) linked according to the direction (D) of sliding of the body of the return member.

10 6. Wiper mechanism according to any of claims 2 to 5, characterized by the body (32) of the return member being in the general form of a section of a fixed wheel pulley, and by the guiding means of the wheel section comprising means for guiding it by sliding in a horizontal plane parallel to the plane in which the guiding groove (34) of the cable (32) extends, and means for guiding it in this plane along the direction D of longitudinal sliding.

15 7. Wiper mechanism according to claim 6, characterized by the fixed support (36, 46) comprising two guiding, horizontal, parallel flanks (66) of the body (32, 40) of the return member that cooperate with the lateral faces (40) opposite from the wheel in order to guide the body (32) of the return member by sliding in a horizontal plane parallel to the plane in which the guiding groove (34) of the cable (21) extends.

20 8. Wiper mechanism according to the preceding claim, characterized by the rear part of the body (32) of the return member, opposite from its front part in which the guiding groove (34) of the cable (21) is formed, comprising a longitudinal cavity (44) in which a guiding notch (48) belonging to a fixed support (36, 46) is received by sliding and in which a compression spring (52) is lodged.

30 9. Wiper mechanism according to claim 7, characterized by the rear part (40) of the body (32) of the return member, opposite from its front part in which the guiding groove (34) of the cable (21) is formed, comprising a longitudinal cavity (44) in which a guiding notch (48) belonging to a fixed support (36, 46) is received

by sliding and in which a compression spring (52) is lodged, and by, in a transversal section, the complementary profiles of the notch (48) and of the cavity (44) are not revolving around the longitudinal sliding direction (D) in a manner to guide the body (32) of the return member by sliding in a horizontal plane parallel to the plane in
5 which the guiding groove of the cable extends.

10. Wiper mechanism according to claim 2, characterized by the body (32, 84, 88) of the return member being mounted turning relative to the fixed support.

10

11. Wiper mechanism according to the preceding claim, characterized by the body of the return member comprising at least one fixed pulley wheel (88) which is born by a plate (84) that is mounted pivoting relative to the fixed support around a pivoting axis (V) parallel to the axis of the wheel of the fixed pulley wheel
15 and off center relative to it, and by the elastic means (52) urging permanently the plate (84) to pivot around it axis (V).

12. Wiper mechanism according to any of claims 2 to 11, characterized by the cable tensioning device comprising anti-return means, notably
20 means of the notch type (56), which are interposed between the fixed support (36) and the body (32) of the return member in order to block the displacement of it in the direction opposite to that corresponding to its involvement with the cable (21).

13. Wiper mechanism according to any of claims 2 to 12,
25 characterized by the body (32) of the return member being a molded piece, notably in a plastic material.

14. Wiper mechanism according to any of claims 2 to 13,
characterized by the fixed support (36) being one molded piece, notably in a plastic
30 material.

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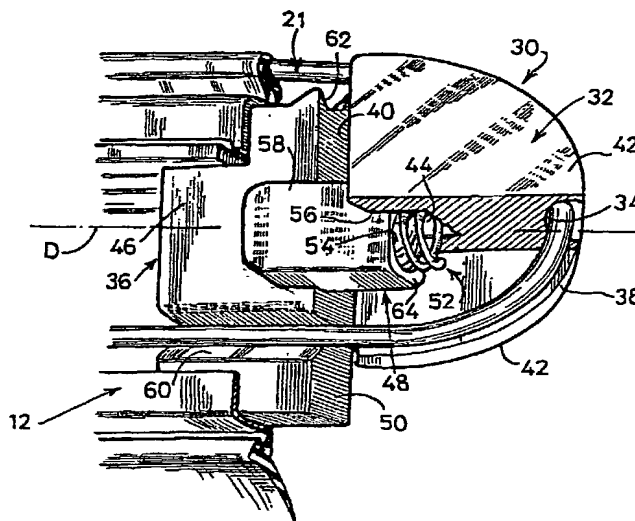
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[Suite sur la page suivante]

(54) Title: WIPER MECHANISM WITH ALTERNATING LINEAR WIPING COMPRISING IMPROVED MEANS FOR TENSIONING THE CABLE

(54) Titre: MECANISME D'ESSUIE-GLACE A BALAYAGE LINEAIRE ALTERNE COMPORTANT DES MOYENS PERFECTIONNES DE TENSION DU CABLE



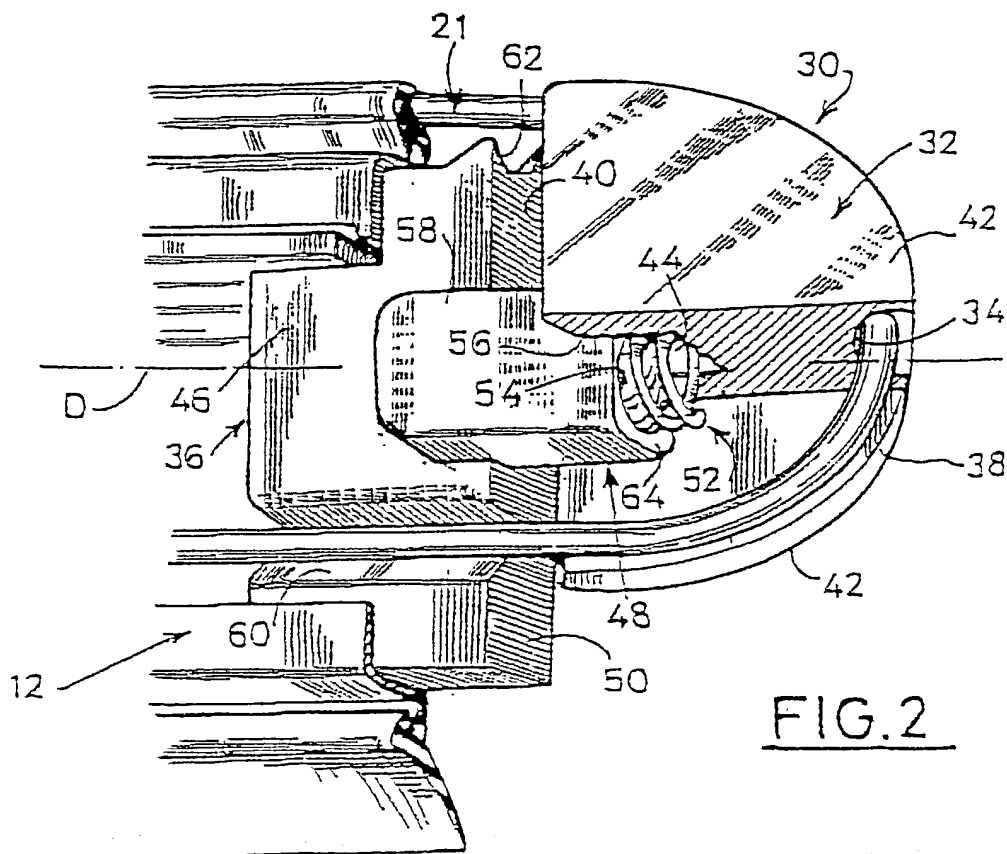
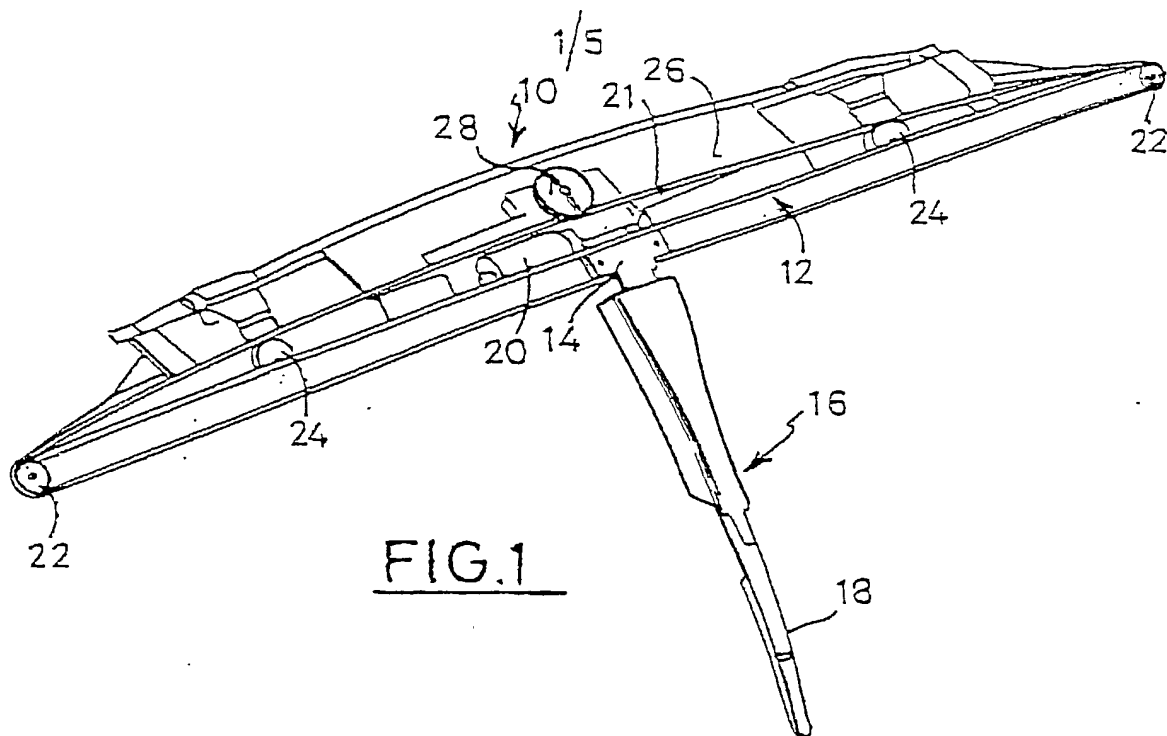
(57) Abstract: The invention concerns a mechanism comprising a guide carriage sliding on a rail and bearing a wiper blade (18), and comprising means driving the carriage including a cable (21) whereof a strand is linked to the carriage (14) and passes along at least a mobile return member (30), comprising a groove (34) guiding the cable (21), which is elastically stressed to form an automatic cable tensioning member. The invention is characterised in that the body of the return member (32) wherein the groove (34) guiding the cable (21) is formed is fixed relative to the linear movement of the cable (21) which slides in the groove, and the cable tensioning device comprises elastic means (52) which urge said body (32) along a direction (D) globally perpendicular to the section of the cable (21) sliding in the guiding groove (34).

[Suite sur la page suivante]

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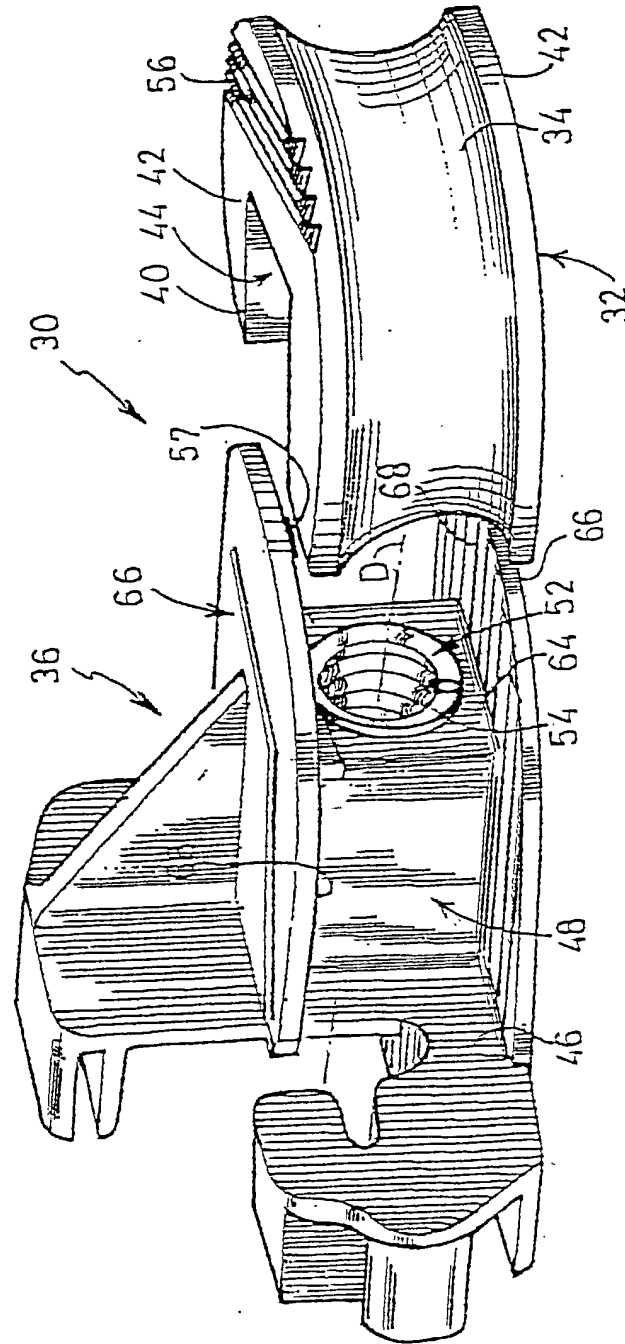
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FIG. 3



$$\frac{3}{5}$$

Fig. 1 is a cross-sectional view of a mechanical assembly. A central shaft (34) passes through a housing (36). The shaft has a flange (21) on the right and a series of vertical pins (52) in the middle. A spring (54) is located between the pins. A cap (56) with a screw (57) is on the right. A dashed line (42) indicates a cross-section. A dimension line (5) is shown at the top and bottom. A label 'D' is on the left.

FIG.5

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FIG.6

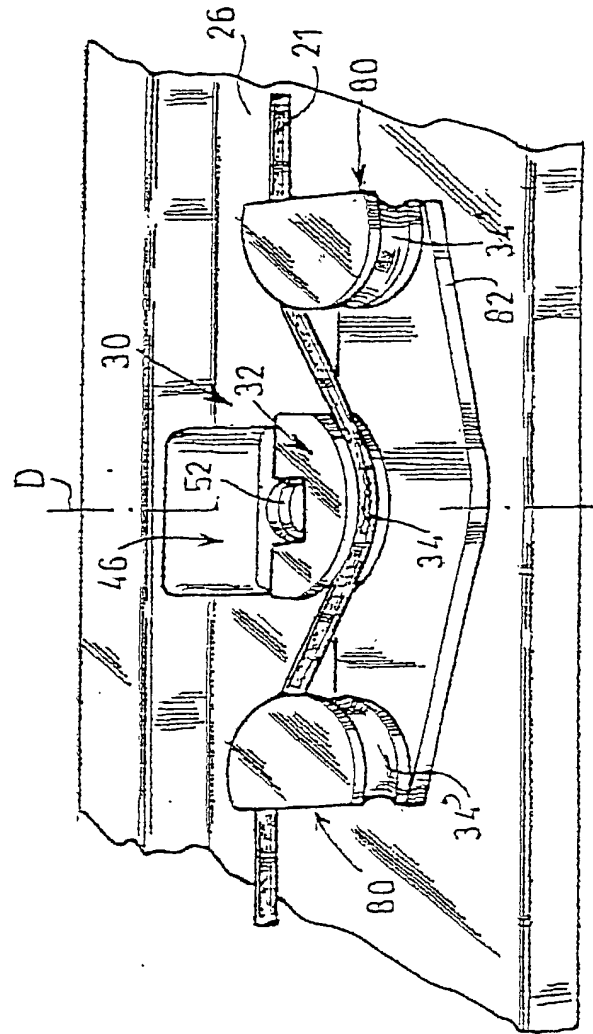
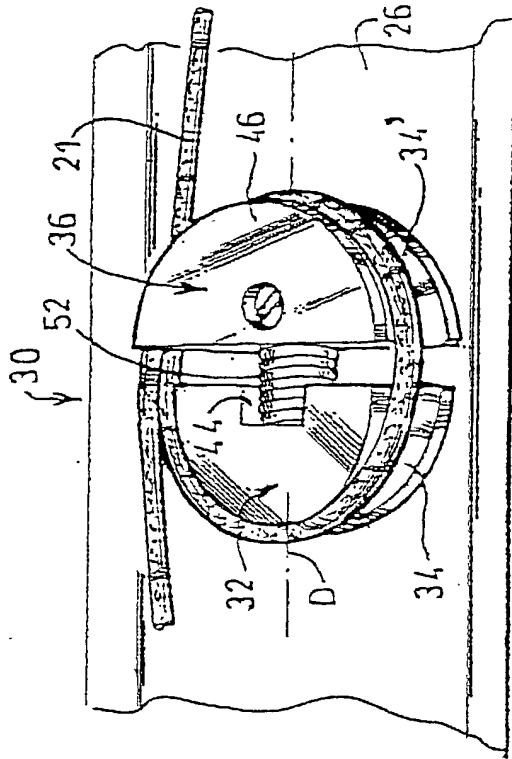


FIG.8

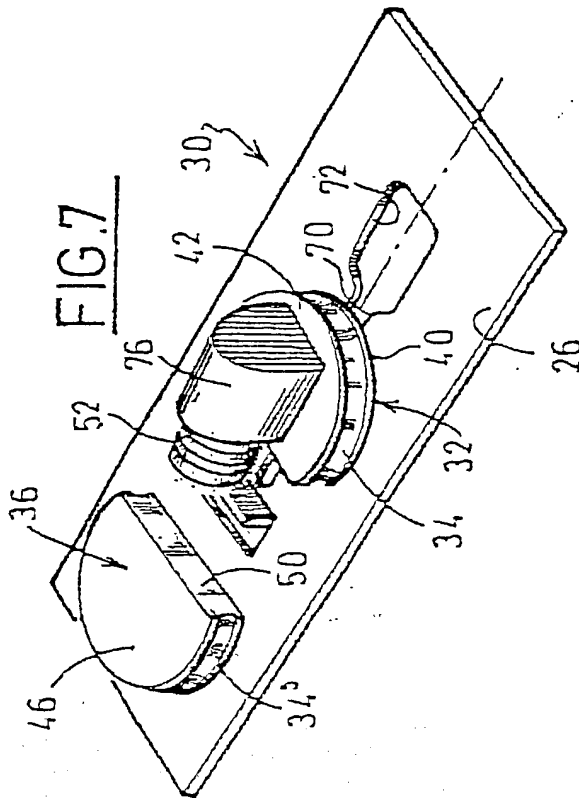


FIG.7

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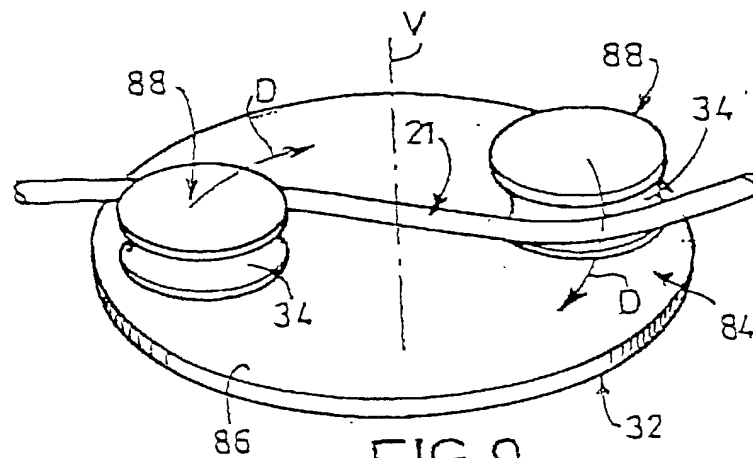


FIG. 9

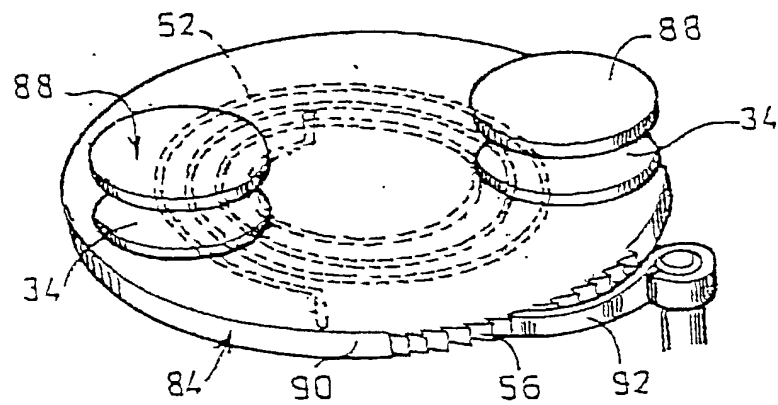


FIG. 10

Our Reference: VMF-495-A (MF0434)

COMBINED DECLARATION AND POWER OF ATTORNEY**DECLARATION:**

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

**WIPER MECHANISM WITH ALTERNATING LINEAR WIPING COMPRISING IMPROVED MEANS
FOR TENSIONING THE CABLE**

the specification of which (check only one item below):

☐ is attached hereto.
☐ was filed as United States application Serial No. _____ on _____, and was amended on or through _____ (if applicable).

☒ was filed as PCT international application Number PCT/FR00/02768 on 02 October 2000, and was amended under PCT Article 19 on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, §119(a)-(d) or §365(b) of any foreign application(s) for patent or inventor's certificate or §365(a) of any PCT international application(s) which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT international application(s) having a filing date before that of the application on which priority is claimed:

Prior Foreign/PCT Application(s) and any Priority Claims Under 35 U.S.C. §119:

Priority Claimed

<u>99/12200</u>	<u>France</u>	<u>30 September 1999</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(Number)	(Country)	(Day/Mo/Yr Filed)	Yes	No
<u> </u>	<u> </u>	<u> </u>	<input type="checkbox"/>	<input type="checkbox"/>
(Number)	(Country)	(Day/Mo/Yr Filed)	Yes	No

I hereby claim the benefit under 35 U.S.C. §119(e) of any United States provisional application(s) listed below.

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(Application Number)	(Filing Date)
<u> </u>	<u> </u>
(Application Number)	(Filing Date)

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) or §365(c) of any PCT international application(s) designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application(s) in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

Prior U. S. Application(s) or PCT International Application(s) Designating the U.S. for Benefit Under 35 U.S.C. §120:

<u> </u>	<u> </u>	<u> </u>
(Application Number)	(Filing Date)	(Status: patented, pending, abandoned)
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(Application Number)	(Filing Date)	(Status: patented, pending, abandoned)

